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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,055	07/25/2005	Mohamed Mekkaoui Alaoui	128905-1005	9851

7590  
Huntsman corporation  
Legal Department  
10003 woodlock Forest Drive  
The Woodlands, TX 77380

EXAMINER
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NGUYEN, VU ANH

ART UNIT	PAPER NUMBER
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4171

MAIL DATE	DELIVERY MODE
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06/26/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/520,055

**Applicant(s)**

MEKKAOU ALAOUI ET AL.

**Examiner**

Vu Nguyen

**Art Unit**

4171

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 15-49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15-49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/IS/D)
- Paper No(s)/Mail Date 07/13/2007.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☒ Other: NPL documents (4 copies).

## **DETAILED ACTION**

### ***Claim Objections***

1. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claim 50 has been renumbered 49.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 15-19, 21, 25-30, 32, 36-41, 43 and 47 are rejected under 35

U.S.C. 102(e) as being anticipated by Ng et al. (U.S. 6,667,360).

4. Regarding these claims, the applicants claim a tool comprising a plastic material and nanoparticles embedded in the plastic material (Claim 15). The plastic material is provided as block material or casting material (Claim 16). The nanoparticles have size

in the range of 15-250 nm (Claim 17), are used in the amount of 5-60 wt% relative to plastic material (Claim 18), and are widely homogeneously distributed in the plastic material (Claim 19). The plastic material is further specified as having a glasslike amorphous structure (Claim 21) and being a polyurethane or an epoxy resin (Claim 25). Claims 26-30, 32 and 36 further claim a conversion tool. Claims 37-41, 43 and 47 further claim a cupping tool.

5. Corresponding to the limitations set forth in these claims, Ng et al. (Ng, hereafter) teaches a polymer nanocomposite stamp comprising a polymer resin and nanoparticles embedded in the resin (col. 2, lines 12-20). The composite material is clearly provided as a block or casting material as it is disclosed that "the mixture was poured into a preheated silicon mold and cured at 75°C for 2.5 hours and then at 120°C for 2.5 hours" (col. 6, lines 7-9). The nanoparticles have size in the range of 1-100 nm (col. 1, line 47) and an example of TiO<sub>2</sub> nanoparticles with average size of 32 nm is disclosed (col. 5, line 65). The amount of the nanoparticles relative to the resin is 1-50 wt% (col. 1, line 46). The nanoparticles are inherently distributed homogeneously in the resin as it is disclosed that "the TiO<sub>2</sub> fillers were dispersed in the epoxy by placing the mixture in an ultrasonic bath at 60°C for about one hour" (col. 6, lines 3-5). The polymer resin has, by definition, an amorphous structure (Encyclopædia Britannica), and is disclosed as an epoxy or polyurethane (col. 1, lines 48-50).

6. The examiner notes that "synthetic resins are not clearly differentiated from plastics" (Encyclopædia Britannica). The examiner also notes that a stamp is a tool used in conversion and cupping processes (Encyclopædia Britannica).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 20, 31, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ng et al. (U.S. 6,667,360) in view of Arpac et al. (U.S. 6,291,070).

10. Claim 20 recites the tool of claim 15 wherein the nanoparticles contain a surface modifier. Claims 31 and 42 are identical to claim 20 but pertaining to a conversion tool and a cupping tool, respectively.

11. Ng teaches a polymer nanocomposite stamp as described above but fails to teach nanoparticles having surface modifier.

12. Arpac et al. teaches a nanostructured molded article comprising a composite which comprises nanoparticles "having polymerizable and/or polycondensable organic surface groups" (Abstract). The preparation of the article involves a step of curing at a

temperature of 60-150°C (col. 1, line 56). The particles comprises TiO<sub>2</sub> nanoparticles (col. 2, line 17) having a preferred mean diameter of 5-50 nm (col. 2, line 13). The organic groups preferably include an epoxy group (col. 3, line 5). The disclosed article is recommended for numerous uses, including casting moulds (col. 9, line 61) and tools (col. 10, line 2). Arpac also teaches that **[Motivation]** the use of the surface-modified nanoparticles in a composite improves scratch and corrosion resistance properties of the composite (col. 9, lines 16-18).

13. In light of such benefits and since both disclosures by Ng and Arpac are in the same field of endeavor (nanocomposite) and deal with similar treatment temperature, the same curable organic group (epoxy), the same type of inorganic nanoparticles, and both disclosures are directed to the same uses, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to employ the surface-modified nanoparticles taught by Arpac in the nanocomposite taught by Ng so as to improve the properties such as scratch resistance and corrosion resistance of the composite due to the covalent bonding between the particles and the resin.

14. Claims 22-24, 33-35, and 44-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ng et al. (U.S. 6,667,360) in view of Saigo et al. (U.S. 6,214,277).

15. Regarding these claims, claim 22 recites the tool of claim 15 further comprising a material with gliding properties embedded in the plastic material. Claim 23 specifies the amount of said material with gliding properties to be 10-60 wt% relative to the plastic material. Claim 24 specifies said material with gliding properties to be selected from the

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group consisting of graphite and molybdenum sulfide. Claims 33-35 further claim the conversion tool of claim 26. Claims 44-46 further claim the cupping tool of claim 37.

16. Corresponding to the limitations set forth in these claims, Ng teaches a polymeric nanocomposite stamp as described above but fails to teach an inclusion of a solid lubricant in the composite.

17. Saigo et al. teaches a plastic composite to be used in gears, bearings, and molded parts with excellent friction and wear properties (Abstract). The composite comprises solid lubricants such as graphite and molybdenum sulfide embedded in a plastic material (col. 1, lines 26-27). The lubricant is employed in an amount of 5-25 wt% relative to the plastic material (col. 7, line 49). Saigo also teaches that **[Motivation]** the inclusion of the solid lubricants gives the gears, bearings, and molded parts "improved friction and wear properties and excellent recyclability at a low cost" (col. 2, lines 58-61).

18. In light of such benefits and considering that both disclosures by Ng and Saigo are concerned with polymeric composites for use in molded parts and both are directed to improving the mechanical properties of the composites (Ng: col. 1, line 12; Saigo: col. 1, lines 19-23), it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the solid lubricants taught by Saigo in the nanocomposite taught by Ng so as to prepare tools and molded parts with improved friction and wear properties as well as excellent recyclability at a low cost.

19. Claims 48 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ng et al. (U.S. 6,667,360).
20. Claim 48 recites a method for converting a metal work piece using a conversion tool identical to that recited in claim 26, and claim 49 recites a method for cupping sheet metal using a cupping tool identical to that recited in claim 37.
21. Ng et al. teaches a polymeric nanocomposite stamp, which can be used for converting metal work piece and cupping sheet metal, as described above. The examiner notes that methods of converting and cupping metal using stamps are well known (Encyclopædia Britannica), and it is obvious that a person having ordinary skill in the art can readily use the disclosed stamp for converting and cupping metal.

#### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vu Nguyen whose telephone number is (571)270-5454. The examiner can normally be reached on M-F 7:30-5:00 (Alternating Fridays).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Lawrence Tarazano can be reached on 571-272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ling-Siu Choi/  
Primary Examiner, Art Unit 1796

Vu Nguyen  
Examiner  
Art Unit 4171